

REMARKS

This Reply is in response to the Office Action mailed on June 18, 2004 in which Claims 1-20, 89-91 and 93-141 were rejected. With this response, Claim 93 is canceled and Claims 1, 16, 17, 18, 89 and 107 are amended. Claims 1-20, 89-91 and 94-141 are presented for reconsideration and allowance.

I. Examiner Interview Summary.

On July 20, 2004, a telephonic interview was held between Examiner Soohoo and Applicants' attorney, Todd A. Rathe. Claims 13, 93, 99, 107, 109 and 111 were discussed. Although no final agreement was reached with respect to the allowability of such claims, Applicants wish to thank Examiner Soohoo for the opportunity to discuss the rejections and for Examiner Soohoo's suggestions for amending the claims to distinguish such claims over the prior art of record.

II. Rejection of Claims 1-7, 11-16, 19-20, 90-91, 93, 96-119 and 121-141 Under 35 U.S.C. § 102(b) Based Upon WO '702.

Paragraph 5 of the Office Action rejected Claims 1-7, 11-16, 19-20, 90-91, 93, 96-119 and 121-141 under 35 U.S.C. § 102(b) as being anticipated by Mintoak pty ltd, WO 97/32702. Claims 1-7, 11-16, 19-20, 90-91, 93, 96-119 and 121-141, as amended, overcome the rejection based upon WO '702.

A. Claim 1.

Claim 1 is amended to incorporate the limitations of now canceled Claim 93. Claim 1, as amended, recites a heavy duty rotary concrete mixing drum having a wall with integral internal formations which radially project towards the center line of the drum. The internal formations have a radial midportion with a cross section formed entirely from one or more layers of substantially non-metallic materials.

WO '702 fails to disclose a concrete mixing drum having a wall with integral internal formations, wherein the integral internal formations have a radial midportion with a cross-

section formed entirely from one or more layers of substantially non-metallic materials. In contrast, WO '702 merely discloses screw flight flex sections formed from reinforced plastics material that are bonded to the barrel surface by laminations of fiberglass reinforced materials applied in situ, in addition to or instead of bolts mounting the screw flight sections to the barrel surface. WO '702 does not disclose internal formations that are integral with the barrel surface and that have a radial midportion formed entirely from one or more layers of substantially non-metallic materials.

Although WO '702 discloses spraying a coating of polyurethane across the entire inner surface of the drum, the application of this coating is only disclosed by WO '702 as being sprayed over the interior surface of an existing metal drum having a metal screw-flight. As a result, this drum disclosed by WO '702 is even heavier than the existing metallic drum. Alternatively, WO '702 discloses spraying a coating of polyurethane on the inner surface of the barrel formed from reinforced plastics sections, wherein a screw-flight assembly, pre-coated with polyurethane, is bolted in place over the polyurethane coated surface of the barrel. (See page 12, lines 7-10 of WO '702). Thus, the resulting coated screw-flight disclosed by WO '702 fails to have a radial midportion formed entirely from one or more layers of substantially non-metallic materials.

Furthermore, the **final** paragraph of the "Summary of the Invention" section on page 12 of WO '702 clearly summarizes the two main inventive features of WO '702. In particular, page 12 recites "This invention resides broadly in a mixing barrel for pre-mixed concrete delivery trucks having" (1) "a barrel assembly and a screw-flight formed from composite materials as optionally defined above" and (2) "an internal surface coated with a wear resistant material as optionally defined above." (Emphasis added). With regard to the barrel assembly and screw-flight, the first citation "as optionally defined above" is clearly referencing the above disclosure which describes the barrel assembly and the screw flight as being individually and independently formed from composite materials and then mounted or bonded to one another by bolts and/or fiberglass laminations. Nothing in the disclosure referenced by this citation on page 12 describes the possibility of integrally forming the screw-flight sections with the barrel surface.

With regard to the internal surface coating, the second citation “as optionally defined above” is clearly referencing the above disclosure of the internal surface of the **metal** drum being coated with polyurethane. At most, the disclosure referenced on page 12 of WO ‘702 discloses a barrel assembly formed from composite materials that is coated with polyurethane and a screw-flight that is coated with polyurethane prior to being mounted or laminated to the surface of the barrel. Nowhere does the disclosure referenced on page 12 of WO ‘702 disclose a screw-flight integrally formed with the barrel surface and having a radial midportion formed entirely from one or more layers of substantially non-metallic materials.

Accordingly, Claim 1, as amended, overcomes the rejection based upon WO ‘702. Claims 2-7, 11-16, 19-20, 90-91, and 96-112 depend from Claim 1 and overcome the rejection based upon WO ‘702 for the same reasons.

B. Claim 16.

Claim 16 depends from Claim 7 which recites that the integral internal formations comprise helical blades. Claim 16 further recites that the blades include embedded therein a continuous glass fibre reinforced elastomer disposed along the length of the blade.

WO ‘702 fails to disclose a spiral mixing blade having a continuous glass fibre reinforced elastomer disposed along the length of the blade. In contrast, WO ‘702 merely discloses either a polyurethane material extending about a metal blade or polyurethane material coated about a Kevlar/carbon fibre composite or a fiberglass woven material and epoxy resin. WO ‘702 does not disclose a glass fibre reinforced elastomer disposed along a length of a blade. Thus, Claim 16 further overcomes the rejection based upon WO ‘702.

C. Claims 99, 100, 128 and 129.

Claims 99 and 128 each recite a concrete mixing drum with a reinforcement member that continuously extends as a single unitary body from a first axial end of the drum across an axial midpoint of the drum. Claims 100 and 129 depend from Claims 99 and 128, respectively, and further recite that the reinforcement member continuously extends as a single unitary body proximate to a second axial end of the drum.

WO '702 fails to disclose a reinforcement member which continuously extends as a single unitary body from a first axial end of the drum across an axial midpoint of the drum (Claims 99 and 128) or that extends proximate to a second axial end of the drum (Claims 100 and 129). As discussed during the Examiner interview held on June 18, 2004, WO '702 merely discloses a drum that is formed from distinct exterior sections: a tapered barrel-shaped base section and a tapered barrel-shaped nose section which are fastened together by bolting. The polyurethane sprayed on the inner surface of a metal drum is not a reinforcement member. Because WO '702 fails to disclose a reinforcement member that continuously extends a single unitary body from a first axial end of the drum across an axial midpoint of the drum or further to the second axial end of the drum, Applicants respectfully request that the rejection of Claims 99, 100, 128 and 129 be withdrawn.

D. Claims 101, 102, 121 and 122.

Claim 101 recites that the internal formations continuously extend as a single unitary body from a first axial end of the drum across an axial midpoint of the drum. Claim 121 recites a spiral mixing blade that continuous extends as a single unitary body from one of the first axial end and the second axial end across an axial midpoint of the drum. Claim 122 depends from Claim 121 and recites that at least a portion of the spiral mixing blade continuously extends proximate to the other of the first axial end and the second axial end.

WO '702 fails to disclose a concrete mixing drum having an internal formation or a spiral mixing blade that continuously extends as a single unitary body from an axial end of the drum across an axial midpoint of the drum or even to a second axial end of the drum. In contrast, WO '702 discloses screw-flight sections of about 1.5 meters to 2 meters in length which are overlapped at their joints. (See page 7, lines 18-28 of WO '702).

E. Claims 102, 103, 113 and 114.

Claim 102 recites a concrete mixing drum which includes a first layer of polymeric material providing at least a portion of the inner surface of a drum and a second layer external to the first layer. The second layer continuously extends as a single unitary body from a first axial end of the drum across an axial midpoint of the drum. Claims 103 and 114 depend from

Claims 102 and 113, respectively, and further recite that the second layer continuously extends as a single unitary body to proximate a second axial end of the drum.

WO '702 fails to disclose a concrete mixing drum having a first layer polymeric material providing an inner surface of the drum and a second layer external to the first layer that continuously extends as a single unitary body from a first axial end of the drum across an axial midpoint of the drum (Claims 102, 113) or that further extends to proximate a second axial end of the drum (Claims 103, 114). As discussed during the Examiner interview held on July 20, 2004, WO '702 merely discloses a drum that is formed from distinct exterior sections, a tapered barrel-shaped section and a tapered barrel-shaped nose section, which are fastened together by bolting. Thus, Applicants respectfully request that the rejection of Claims 102, 103, 113 and 114 be withdrawn.

F. Claims 107, 124, 132 and 138.

Claims 107, 124, 132 and 138 each recite a concrete mixing drum having a formation or spiral mixing blade with a radial midpoint having a cross-sectional thickness provided by a single homogenous polymeric material.

WO '702 fails to disclose a concrete mixing drum having a spiral mixing blade or internal formation that has a radial midpoint with a cross-sectional thickness provided by a single homogenous polymeric material. In contrast, WO '702 requires its spiral mixing blade to have a radial midpoint with a cross-sectional thickness provided by multiple distinct layers of materials. For example, in one embodiment, WO '702 requires a polyurethane coating over a metal fin. In another embodiment, WO '702 requires a polyurethane layer over a fiberglass core. Thus, Applicants respectfully request that the rejection of Claims 107, 124, 132 and 138 be withdrawn.

G. Claims 109, 130 and 134.

Claims 109, 130 and 134 each recite that the spiral mixing blade includes a root, a tip and a midportion between the root and the tip. The midportion is flexible so as to deflect into a sail-shaped surface cupped to contain concrete when experiencing concrete loading. Figure

21 illustrates a midportion of the spiral mixing blade deflecting during concrete loading into a sail-shaped surface cupped to contain concrete.

WO '702 fails to disclose flight sections which are configured to deflect into a sail-shaped surface cupped to contain concrete when experiencing concrete loading. In contrast, WO '702 discloses flight sections which are formed from a rigid metal or from a relatively rigid fibre reinforced core. As shown by Figures 5-8 of WO '702, the radial midportions of such flight sections are configured to be at least as rigid as the tip and root of such blade sections so as to prevent deflection into a sail-shaped surface cupped to contain concrete. Accordingly, Applicants respectfully request that the rejection of Claims 109, 130 and 134 be withdrawn.

H. Claims 111 and 131.

Claims 111 and 131 recite that the drum omits external and internal seams circumferentially extending about an axial center line of the drum.

WO '702 fails to disclose a drum which omits external and internal seams circumferentially extending about an axial center line of the drum. As noted during the Examiner interview held on July 20, 2004, WO '702 discloses a drum that is formed from distinct exterior sections, a tapered barrel-shaped base section and a tapered barrel-shaped nose section which are fastened together by bolting. The junctions of such sections form circular seams and circumferentially extend about an axial center line of the drum. Such seams may constitute points of weakness, locations for accumulation of set concrete or may require bolting or the like which adds weight to the drum. Accordingly, Applicants respectfully request that the rejection of Claims 111 and 131 be withdrawn.

I. Claim 112.

Claim 112 depends from Claim 1 and recites that the drum further includes a track ring formed from fiber reinforced plastic. WO '702 fails to disclose a track ring formed from fiber reinforced plastic. In contrast, WO '702 merely discloses a conventional steel track

ring. Accordingly, Applicants respectfully request that the rejection of Claim 112 be withdrawn.

III. Rejection of Claims 17 and 89 Under 35 U.S.C. § 102(b) or Under 35 U.S.C. § 103(a) Based Upon WO '702.

Paragraph 6 of the Office Action rejected Claims 17 and 89 under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as being obvious over Mintoak pty ltd, WO 97/32702. Claims 17 and 89, as amended, overcome the rejection based upon WO '702.

Claim 17, as amended, recites that the mixing drum includes an intermediate polymeric layer between the inner layer and the structural layer, wherein the inner layer and the intermediate layer are differently colored so as to serve as wear indicators. With this Reply, Figure 18g is added. Figure 18g illustrates an intermediate polymeric layer 75 which is differently colored so as to serve as a wear indicator. Support for added Figure 18g is found on page 20, lines 16-18. Further support may be found on page 14, lines 11-17 which clarify that the one or more additional layers colored to provide wear indicators are polymeric. Thus, no new matter is believed to have been added.

WO '702 fails to disclose an intermediate polymeric layer between the inner layer and the structural, wherein the inner layer and the intermediate layer are differently colored so as to serve as wear indicators. In contrast, WO '702 merely discloses a metal drum over which is sprayed polyurethane. Alternatively, WO '702 discloses polyurethane layers which are wrapped about a fiberglass core. WO '702 does not disclose an inner polymeric layer and an intermediate polymeric layer which are differently colored so as to serve as wear indicators. Accordingly, Claim 17, as amended, overcomes the rejection based upon WO '702.

Claim 89 depends from Claim 2 recites that the inner layer has a white pigment. As recited on page 20, lines 17 and 18 of the present application, the white pigment facilitates cleaning and inspection after use.

WO '702 fails to disclose an inner polymeric layer having a white pigment. Accordingly, Claim 89, as amended, overcomes the rejection based upon WO '702.

IV. Rejection of Claims 8-10 and 94-95 Under 35 U.S.C. § 103 Based Upon WO '702.

Paragraphs 7 and 8 of the Office Action rejected Claims 8-10 and 94-95 under 35 U.S.C. § 103(a) as being unpatentable over Mintoak pty ltd, WO 97/32702. Claims 8-10 and 94-95 overcome the rejection under 35 U.S.C. § 103(a) based upon WO '702 for the reasons which follow.

Claim 8 depends from Claim 7 which depends from Claim 1. Claim 8 overcomes the rejection for the same reasons discussed above with respect to Claim 1.

Claim 9 recites the strength of the structural layer of the drum is around 600 Mpa at a drum wall thickness of approximately 8mm. As acknowledged in the Office Action, WO '702 fails to disclose that each structural layer has a strength of around 600 Mpa at a drum wall thickness of approximately 8mm. As a result, the Office Action asserts that:

It would have been obvious to one of ordinary skill in the art to without undue experimentation to determine an appropriate wall thickness and pitch range values so that the drum is strong and lightweight and provide an effective through put and mixing.

However, increasing the strength of the structural layer of a drum is not as simple as simply increasing the wall thickness and finding an appropriate wall thickness. One of ordinary skill in the art would not necessarily be able to simply experiment with the thickness of the walls as taught by WO '702 to achieve a strength of around 600 Mpa while still maintaining a thickness of approximately 8mm. In contrast, Applicants have discovered a wall that only has a thickness of approximately 8mm but has a structural strength around 600 Mpa. In particular, construction of the wall disclosed by WO '702 would not necessarily lend itself to being modified so as to achieve both a structural strength of around 600 Mpa while maintaining a wall thickness of only approximately 8mm. Accordingly, Applicants respectfully request that the rejection of Claim 9 under 35 U.S.C. § 103 based upon WO '702

be withdrawn. Claim 10 depends from Claim 9 and overcomes the rejection for the same reasons.

Claim 94 depends from Claim 1 and recites that at least a portion of the internal formations has a pitch of 2 meters. Claim 94 depends from Claim 1 and overcomes the rejection for the same reasons discussed above with respect to Claim 1.

Claim 95 depends from Claim 1 and recites that the internal formations have a root with a radius of greater than 10 millimeters. Because the root has a radius of greater than 10 millimeters, unwanted accumulation of set concrete is avoided. WO '702 fails to disclose an internal formation having a root with a radius of greater than 10 millimeters. Moreover, WO '702 fails to provide any motivation or suggestion for modifying its blade so as to have a root with a radius of greater than 10 millimeters. In fact, this spiral mixing blade shown in Figure 5 of WO '702 teaches one of ordinary skill in the art away from providing a spiral mixing blade with an enlarged root with a radius of greater than 10 millimeters. Thus, Applicants respectfully request that the rejection of Claim 95 based upon WO '702 be withdrawn.

V. Double Patenting Rejection of Claims 17 and 89.

Paragraph 10 of the Office Action indicated that should Claim 17 be found allowable, Claim 89 would be objected to under 37 CFR § 1.75 as being a substantial duplicate thereof. With this response, Claims 17 and 89 are each amended. As amended, Claims 17 and 89 are no longer substantially duplicates of one another.

VI. Added Figure 18g.

With this response, the application is amended to add Figure 18g. A complete set of replacement sheets including newly added Figure 18g is filed herewith. A separate letter to the official draftsman and replacement sheets are also filed herewith.

As noted above, the Remarks section III with regard to Claims 17 and 89, support for added Figure 18g is found on page 20, lines 16-18. Further support may be found on page 14, lines 11-17 which clarify that the one or more additional layers colored to provide wear indicators are polymeric. Thus, no new matter is believed to have been added.

VII. Amendment to Title.

With this Reply, the title of the present application is amended to delete "VEHICLE MOUNTED" which is believed to be unnecessary and unduly limiting. The title, as amended, should read "PLASTICS DRUM FOR CONCRETE MIXING AND METHODS OF MANUFACTURE THEREOF."

VIII. Conclusion.

After amending the claims as set forth above, claims 1-20, 89-91 and 94-141 are now pending in this application.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 06-1447. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 06-1447. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 06-1447.

Respectfully submitted,

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By Todd A. Rathe

FOLEY & LARDNER LLP
Customer Number: 26371
Telephone: (414) 297-5710
Facsimile: (414) 297-4900

Todd A. Rathe
Attorney for Applicant
Registration No. 38,276

Amendment to the Drawings

Please add Figure 18g.